The Hierarchy of Evidence

The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynyk and Fineout-Overholt (2011).

I Evidence obtained from a systematic review of all relevant randomised control trials.

II Evidence obtained from at least one well designed randomised control trial.

III Evidence obtained from well-designed controlled trials without randomisation.

IV Evidence obtained from well designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case-series

V Evidence obtained from systematic reviews of descriptive and qualitative studies

VI Evidence obtained from single descriptive and qualitative studies

VII Expert opinion from clinicians, authorities and/or reports of expert committees or based on physiology


<table>
<thead>
<tr>
<th>Reference (include title, author, journal title, year of publication, volume and issue, pages)</th>
<th>Evidence level (I-VII)</th>
<th>Key findings, outcomes or recommendations</th>
</tr>
</thead>
</table>
- Very little evidence for method of dressing, positioning of drainage unit, clamping of chest drains, patient position & breathing during tube removal.  
- Milking and stripping of chest drains did not make a difference to drain patency or drainage volume in 3 out of 4 studies, no difference in haemodynamic complications in groups that had milking compared to groups with no milking  
- Chest drain removal is very painful and patients require adequate analgesia and preparation time |
- Troubleshooting of underwater seal drains  
- Avoidance of milking of drains  
- Avoidance of clamping drains  
- Description of the purpose of the 3 chambers of the underwater seal drain |
- Care for chest drain during transport  
- Positioning of chest drain below level of chest at all times  
- Indications for changing drain  
- Procedure for drain removal, including importance of analgesia  
- Complications of chest drains and nursing management & trouble shooting  
- 'Milking' of the chest drain is not recommended due to the high negative pressure & potential tissue damage it causes |
- Securing of chest drains using sutures and a ‘omenta tag’ of tape  
- Danger of clamping chest drains; and ensuring if patient respiratory status deteriorates that the drain is checked to ensure it is unclamped  
- Suction on chest drains depends on reason for chest drain insertion  
- No evidence that disconnecting suction briefly to allow for mobilization is harmful  
- Timing of drain removal during expiration  
- Daily observations required of drain tube |
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<td>Randomized controlled trial in children undergoing cardiac surgery comparing underwater seal (UWSD) versus high vacuum drains performed at RCH. Redivac drains were as safe as UWSD, and had lower incidence of residual pleural effusion requiring drainage. Identifies why the majority children at RCH undergoing cardiac surgery have a Redivac drain rather than UWSD for their management</td>
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<td>Importance of clinical signs and symptoms to identify nearly all patients with significant pneumothorax post chest drain removal in children post cardiac surgery. Currently chest x-ray should still be performed post chest drain removal</td>
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<tr>
<td>Observations and daily assessment required of chest drains. Safe positioning of chest drains. Danger of clamping chest drains (except during bottle change) including during transport. Chest drain removal: timing with respiration &amp; two person procedure with defined roles</td>
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<td>Close clinical monitoring post chest drain removal for infants with a chest drain for pneumothorax identified all clinically relevant pneumothorax. In this study no asymptomatic infant had a clinically undetected pneumothorax on chest x-ray</td>
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